

Is the symptom correctly interpreted by patients who apply to a neurology practice with the complaint of dizziness?

Symptom interpretation and dizziness

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Abstract

Aim: Patients with subjective dizziness usually interpret their symptoms as occurring as a result of a physical disorder and put the psychological dimension of their complaints in the background. In this study, it was aimed to help vertigo patients interpret their symptoms correctly, to examine the relationship between these symptoms and various other factors, and to investigate the effects of the handicap of vertigo.

Material and Methods: Our cross-sectional, randomized, and controlled study included 45 patients with normal cognition and 41 healthy controls in the age range of 18-50 years. Detailed analysis was performed for those suffering from complaints of dizziness and to exclude an organic pathology for these patients. All participants were administered the Dizziness Handicap Inventory (DHI) and the Symptom Interpretation Questionnaire (SIQ) was used to assess the quality of life of the patients.

Results: In patients (women/men: 36/9), the DHI score was 44.16±20.89 (mean±SD), and the group consisted of moderately handicapped individuals at a rate of 44%. Symptom interpretation was dominant in the patients with normalizing, psychological, and somatizing styles ($p<0.05$). Somatizing and normalizing styles were shown to correlate with impaired quality of life due to dizziness ($p=0.001$, $\rho=0.512$ and $p=0.008$, $\rho=0.408$, respectively).

Discussion: Our findings indicate a close relationship between vertigo and somatization. In patients who describe nonspecific dizziness, the possibility that a tendency of corporatization may mask the underlying psychological disorder should be taken into consideration, and the diagnosis and treatment of these patients should be carried out with a multidisciplinary approach.

Keywords

Dizziness Handicap Inventory, Psychogenic Dizziness, Vertigo, Disability Due to Dizziness

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Introduction

Vertigo or dizziness is not a disease in itself; it is a leading symptom of various diseases of different etiologies [1]. Etiological causes are quite extensive, from peripheral, central, and vestibular disorders and other organic causes to somatoform disorders and their various combinations [2]. Complaints may be associated with psychiatric disorders in about 30-50% of patients [3]. These disorders were defined as anxiety/phobic (45.5%), somatoform (41.4%), or depressive disorders (13.1%) [3].

Psychiatric comorbidity accompanying subjective vertigo is a risk factor for a chronic poor course in these patients and is responsible for an increase in handicap [4]. This condition is often called psychogenic or psychiatric or functional dizziness. Some patients have both organic and non-organic disorders at the same time. In this combined association, the assessment of symptoms becomes more complex and their clinical repercussions vary depending on the individual's personality and lifestyle [5].

Furman et al. discussed the importance of neuroanatomic connections between vestibular stimuli and the emotional response processing system to explain the comorbidity of vertigo and psychiatric disorders [6]. Such a distorted awareness of somatic sensory stimuli (somatosensory amplification) may contribute to the links between vertigo/dizziness and somatoform disorders and anxiety disorders [7]. Somatosensory amplification shapes the aspects of cognitive processing rather than just internal perception sensitivity [8]. However, the specific mechanisms related to the connection pathways remain unclear. Regardless of the causal relationship between dizziness and psychiatric findings, this symptom is a major problem for vertigo clinics in terms of diagnosis and differential diagnosis [5].

On the basis of the importance of vertigo in possible psychiatric disease symptomatology, the main purpose of our work is to assess how accurately the patients admitted to our clinic with dizziness can interpret their symptoms and to what extent the symptoms of dizziness and psychological disorders appear as interchangeable symptoms. The hypothesis that we tested was that high rates of frequent visits to neurology clinics are due to the perception that an organic pathology has occurred as a result of individuals having somatic psychopathology under the mask of dizziness.

Material and Methods

Study design and participants

A cross-sectional study was conducted to evaluate the relationship between somatosensory, motor, and psychological variables and disability levels in patients with dizziness. The study included 45 patients with dizziness in the age range of 18-50 years and 41 individuals without dizziness as a control group. Written informed consent was obtained from all participants before inclusion. All participants were provided with a description of the study procedures, which were planned according to the ethical standards of the Declaration of Helsinki and approved by the Bozok University Clinical Research Ethics committee.

The inclusion criterion for the study was the application of

individuals to our outpatient clinic for etiology investigation due to dizziness. Exclusion criteria were as follows: (a) presence of neurological symptoms (strength deficit in the extremities, gait disturbance situations); (b) vertebrobasilar insufficiency, dizziness, types of dizziness due to causes such as cardiovascular dizziness or migraine, or neurodegenerative diseases such as cervical spinal cord pathologies, stroke, epilepsy, multiple sclerosis, or Parkinson disease; (c) patients who were treated for vertigo in the last 3 months and required medication at their last admission; (d) patients with cognitive impairment or mental retardation; (e) patients with insufficient language understanding to follow the measurement instructions; (f) patients with impaired hearing and balance, pregnant women and nursing mothers, and patients with visual pathologies.

Neurological and clinical assessment

Medical specialists performed complete neurological, neuro-otologic, and neuro-ophthalmological examinations of all patients, as well as subjective measurements for vestibular testing and head impulse testing. Laboratory tests including blood count, plasma glucose, lipid profile, and electrocardiography were examined at the stage of etiological diagnosis, and individuals with normal findings were invited for scale evaluation. Organic exclusion was achieved using magnetic resonance imaging when necessary, depending on the severity of the patient's complaints. The head impulse test was performed when peripheral vertigo was negative and the patient did not have nystagmus. In addition, the patient group was composed of individuals whose otological examinations and tests were negative in terms of the possibility of peripheral vertigo. If there were no structural disorders that explained the symptoms of the patients, functional/psychiatric symptoms were assessed by a psychiatrist and neurologist in a preliminary interview and the patients were evaluated.

Self-reported questionnaires

Sociodemographic data form: After agreeing to participate in the study, a sociodemographic form prepared by the researchers was given to all patients to be filled out together with the scales on the same day. The sociodemographic form included brief anamnesis information such as age, gender, education level, marital status, and complaints (duration of symptoms, accompanying treatments and comorbidities, etc.).

After that, patients completed self-reported scales that measure dizziness-induced disability and symptom interpretation skills.

Dizziness Handicap Inventory (DHI): The DHI is a scale that is not difficult for patients to complete and understand, which shows the degree of impact, emotional status, and functionality of the quality of life of patients who suffer from dizziness [9]. Although this personal questionnaire has been developed to measure the effect of dizziness complaints in diseases of the vestibular system, it can also be used with other dizziness problems not of vestibular origin. The validity and reliability study of the Turkish version was conducted by Ellialtıoğlu et al. in 2001 [10].

The DHI contains 25 points that assess problems with dizziness. Nine questions address the functional, nine questions address the emotional, and seven questions address the physical state. Each question has the possible answers of "no" (0 points), "sometimes" (2 points), and "yes" (4 points), and the highest

score is 100. High values indicate that the disorder is more severe. Points between 0 and 30 indicate mild severity of the disorder, points between 31 and 60 indicate moderate severity, and points between 61 and 100 indicate severeness.

Symptom Interpretation Questionnaire (SIQ): The SIQ is a scale investigating the three dimensions of somatization, psychologization, and normalization to attribute symptoms used when interpreting common somatic symptoms as bodily causes.

The SIQ records the presence of 13 common somatic symptoms, such as headache and fatigue. For each symptom, patients are asked to consider whether they would interpret the symptom as the result of emotional stress (psychological attribution style), an environmental factor (normalizing attribution style), or physical predisposition (somatizing attribution style). Each association is scored from “not at all” to “very much” on a 4-point Likert scale. The SIQ has been verified in terms of its reliability and test-retest correlation, and the validity and reliability of the Turkish version were confirmed [11, 12]. The four-point Likert-type scale was converted to a five-point Likert-type scale because of its more common usage in Turkish measurement tools. In a study conducted by Mirdal, the total number of items was increased to 14 by adding the symptom of “chest tightness,” which is commonly seen among Turkish immigrants and may be unique to Turkish culture [12].

Statistical analysis

SPSS 22 (IBM Corp., Armonk, NY, USA) was used for statistical analysis. Median values, lowest and highest values, and interquartile range values were used for descriptive statistics in nonparametric tests, while mean±standard deviation (SD) values were used in parametric tests. To test for differences in self-reported questionnaire scores between vertigo/dizziness subgroups, we calculated descriptive statistics and performed chi-square tests for gender, age, and vertigo/dizziness duration. Age averages were compared with independent t-tests.

The relationship between psychological and physical variables and disability related to dizziness was analyzed using the Pearson correlation coefficient. A Pearson correlation coefficient of >0.60 showed a strong correlation, a coefficient between 0.30 and 0.60 showed moderate correlation, and a coefficient of <0.30 showed low correlation. Values of $p < 0.05$ at a 95% confidence interval were considered statistically significant.

Results

In our study, there were 36 women and 9 men in the patient group and 25 women and 16 men in the control group. The groups were similar to each other in terms of gender ($p = 0.052$). The ages and interquartile range values of the individuals in the patient group varied by 29 (22-37.81) years, with an average age of 30.57 ± 10.10 years. The ages of the individuals in the control group also varied by 29 (24-38) years and their average age was 30.47 ± 7.58 years. In the patient group, the DHI score was 44.16 ± 20.89 (mean±SD) and 14 (31%) individuals experienced a mild handicap, 20 (44%) individuals experienced a moderate handicap, and 11 (25%) individuals experienced a severe handicap due to dizziness. In the patient group, the participants were mostly students (16 volunteers, 36%) and housewives (16 volunteers, 36%), while in the healthy control

group, there were also students (14 volunteers, 35%) and civil servants (16 volunteers, 40%) ($p = 0.001$). All demographic characteristics of the groups are presented in Table 1.

When the distribution of subgroup test analysis of the SIQ scale was examined in groups, an average of 9.61 ± 2.49 individuals evaluated their symptoms as positive in the patient group, while

Table 1. Descriptive statistics regarding the sociodemographic data of the participants

	Dizzy patients (n=42)	Healthy controls (n=35)	Test statistics (df, χ^2 ; U, Z)	p
Age, years, median (IQR)	29 (22-37.81)	29 (24-38)	U: 830.50 Z: -0.457	0.648*
Symptom duration, months, %	1.5 (0.60-4.00)	NA	NA	-
Dizziness scale, mean±SD	44.16±20.89	NA	NA	-
Gender, n, female / male (%)	36 (80%) / 9 (20%)	25 (61%) / 16 (39%)	df: 1 χ^2 : 3.766	0.052 ^a
Employment status, n (%)				
Student	16 (36%)	14 (35%)		
Teacher	3 (7%)	3 (8%)		
Self-employed	6 (14%)	3 (9%)	χ^2 : 17.508	0.001 ^b
Housewife	16 (36%)	5 (8%)		
Civil servant	4 (7%)	16 (40%)		
Marital status, n (%)				
Single	21 (48%)	24 (59%)	df: 1 χ^2 : 0.995	0.318 ^a
Married	22 (54%)	17 (41%)		
Education time, years, n (%)				
8 years	7 (16%)	3 (7%)		
11 years	16 (36%)	9 (22%)	df: 2 χ^2 : 4.740	0.093 ^a
>11 years	22 (48%)	19 (71%)		
Antidepressant treatment, n (%)				
None	33 (71%)	35 (85%)	df: 1 χ^2 : 1.877	0.171 ^a
Yes	12 (29%)	6 (15%)		
Dizziness Handicap Inventory (DHI)				
Mild handicap (0-30)	14 (31%)			
Moderate handicap (31-60)	20 (44%)	NA	NA	
Severe handicap (>61)	11 (25%)			

IQR: Interquartile range, SD: standard deviation. Values are presented as mean±standard deviation, median (IQR), or number (%). Values of $p < 0.05$ are statistically significant. * Mann-Whitney U test, ^a Pearson chi-square test, ^b Fisher exact test.

Table 2. Subgroup scores of the Symptom Interpretation Questionnaire (SIQ)

Subgroup scores	Range	Dizzy patients (n=42)	Healthy controls (n=35)	Test statistics
Positive number of symptoms, mean±SD	0-14	9.61±2.49	5.26±2.68	t: 7.593 df: 79.56 $p < 0.001$ ^a
Somatizing style, mean±SD	0-39	23.37±10.77	10.80±6.89	t: 6.290 df: 80 $p < 0.001$ ^a
Psychologizing style, mean±SD	0-39	29 (18-39.5)	15.51 (9-22)	U: 368.50 Z: -4.381 $p < 0.001$ ^b
Normalizing style, mean±SD	0-39	24.95±10.22	17.80±10.95	t: 3.054 df: 80 $p = 0.003$ ^a

Values are presented as mean±standard deviation and median (IQR).

Values of $p < 0.05$ are statistically significant. ^a Mann-Whitney U test, ^b Student's t-test.

Table 3. Correlations between the Symptom Interpretation Questionnaire (SIQ) and some outcome variables

SIQ	Age (years)		Symptom duration (months)		DHI score	
	rho/r coefficient	P	rho/r coefficient	P	rho/r coefficient	P
Somatizing style	0.193	0.238	0.264	0.099	0.512	0.001
Psychologizing style	-0.141	0.392	0.309	0.053	0.302	0.055
Normalizing style	-0.134	0.416	0.184	0.255	0.408	0.008

DHI: Dizziness Handicap Inventory. Values of $p < 0.05$ are statistically significant.

5.26±2.68 individuals in the control group completed the scale with positive symptoms. Mean±SD and median (IQR) values obtained for the SIQ subgroup scores, which are evaluated as somatizing, psychologizing, and normalizing styles, were higher in the patient group and the statistical difference was $p < 0.05$ (Table 2).

In addition, when correlation analyses between the groups' ages, symptom duration of vertigo, and subgroup scores of the SIQ and DHI were performed, no significant correlations were found for age and symptom duration. With $\rho = 0.512$, $p < 0.001$, there was a moderate positive correlation between the DHI and somatizing style, and with $\rho = 0.408$, $p = 0.008$, a significant correlation was found between the DHI and normalizing style (Table 3).

Discussion

The aim of this study was to determine the differences in somatosensory, motor, and psychological variables and to examine the relationship between these variables and disability due to dizziness in patients with the complaint of dizziness who were admitted to our referral clinic. The results of this study showed that general and specific psychological factors of dizziness in admission to a neurology clinic were strongly associated with somatization and normalization findings and dizziness, handicap, and somatization in a representative sample of patients.

It is known that there are numerous and various physical complaints in balance disorders. Psychological dizziness is a diagnosis made only when no organic disorder causing vertigo/dizziness is detected and positive responses are given in neuropsychiatric questionnaires [13]. In recent years, emphasis has been placed on research and analysis of the psychiatric component of vertigo in both the elderly and young people [14-16]. Ardic et al. showed with a psychiatric screening scale that somatization scores were higher in patients with vertigo [5]. Studies have also reported psychogenic dizziness progression in a wide range of 9-50% [3, 15]. This psychological dimension of dizziness has been investigated in a variety of studies, from the neuroanatomic background to behavioral perspectives [15]. In previous studies in the literature, cases in which the psychogenic component was identified as chronic subjective dizziness and persistent postural-perceptual dizziness included cases of persistence of complaints for at least 3 months. In the cases included in this study, the ability of individuals with shorter symptom duration to correctly define and observe their

complaints were investigated. In our study population, with patients for whom an etiological cause could not be found with comprehensive questionnaires, it was observed that individuals tended to somatize their complaints. In our study, patients who went to the doctor's office were significantly more likely to exhibit psychological and normalizing qualities of common somatic symptoms. This is probably due to the fact that patients referred to hospital clinics have more severe health-related anxiety or a lower likelihood of accepting psychological or normalizing explanations of unexplained symptoms. In addition, in the patient group, the majority of participants were students and housewives, while the control group included students and civil servants. The working life of individuals contributes to satisfaction in life and increased problem-solving skills and ultimately the increase of quality of life as well as the continuity of cognitive functions [17]. As a result, we believe that an individual who is more skilled at expressing himself or herself can describe and convey symptoms more correctly.

Patients with acute dizziness are more often referred to the emergency department. However, there are functional disorders that can be defined as psychogenic, non-organic, or conversion disorders among the patients who are most frequently referred to clinical neurologists [18]. Correct diagnosis of these patients is very important for successful treatment and for the prevention of socioeconomic losses, healthcare costs, and losses in the workforce. Research has shown that, in the treatment of psychological vertigo, patient education, psychological counseling, and mental health education can be important steps in therapeutic processes besides medication [19].

Some studies investigating psychiatric predisposition in vertigo observed the coexistence of psychiatric comorbidities in some groups of organic vertigo and dizziness patients, such as Meniere's disease and vestibular migraine [20, 21]. Therefore, the prognosis and course of the disease is poor and anxiety/panic-related cognition or incompatible coping strategies develop along with these complaints. Psychiatric tendencies emerge because of the negative beliefs that develop in these patients [22]. It was found that chronic stress processes contribute significantly in a recent study investigating risk factors for various types of vertigo in young people [23]. Even though disorders of the vestibular system are observed to be rarer in young people, stress is seen at the forefront in etiological research [24]. In dizziness-related handicap formation, the worst combination has been seen to occur in cases where non-organic vertigo/dizziness and psychiatric comorbidity are intertwined [22]. If the vertigo/dizziness attacks of the patients cannot be controlled, individuals may develop anxiety and panic-related behaviors and this can sometimes lead to the development of avoidance behavior [25]. In our study, the tendency to somatize symptoms was observed via the SIQ in relatively younger individuals with dizziness with good cognition levels. They also had high psychological and normalizing tendencies. Normalized styles correlated with the DHI, as well. The inability of individuals to define their complaints objectively disrupts effective treatment and causes serious socioeconomic burdens. In order for physicians to quickly treat the patient with an appropriate treatment strategy, it is important that they first

examine the patient thoroughly and therefore make the correct diagnosis. Accordingly, it is very important to be able to define and interpret the symptoms correctly.

This study has some limitations that need to be taken into account. Given that this is a cross-sectional study, one of its main limitations is its inability to thoroughly investigate etiological causes. We were also unable to provide long-term observational follow-up and expand our findings objectively. If we had utilized more detailed psychiatric interviews to analyze the psychopathologies underlying the etiology in this age group, we would have been able to collect more detailed data. More detailed interviews with the patients over a fairly long period of time would also be helpful. It is important to perform analysis of educated versus uneducated patients or patients with different cultural or religious beliefs to evaluate the effects of social structures. Detailed psychological analyses could also be paired with hormonal and biochemical laboratory parameters with larger samples in future studies. In this study, we established our hypothesis using a scale that has not been tested in cases of vertigo before.

Conclusions

The results of this study show that psychosomatic variables are present in patients with dizziness of unknown etiology and that the effect of these variables leads to an increase in the perception of disability due to dizziness. Based on these results, we think that disability related to dizziness can be deeply affected by emotional factors and can therefore play a similar role in the perception of disability. When we consider the state of anxiety that real vertigo can cause, the anamnesis to be taken from the patient in the outpatient clinic becomes very important.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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